

- 1 - Mangrove
- 2 - Scrub Mangrove
- 3 - Saltmarsh
- 4 - Buttonwoods
- 5 - Hammocks
- 6 - Pinelands
- 7 - Exotics
- 8 - Developed
- 9 - Freshwater Hardwoods
- 10 - Freshwater Pine
- 11 - Freshwater Marsh
- 12 - Grasslands
- 13 - Water
- 16 - Ridge/Hamock
- 17 - Dune



Proposed  
Project Boundary

Habitat Boundary

## Key West International Airport RSA Improvements

USFWS Key Deer Refuge Road Removal

Figure 6 PRELIMINARY

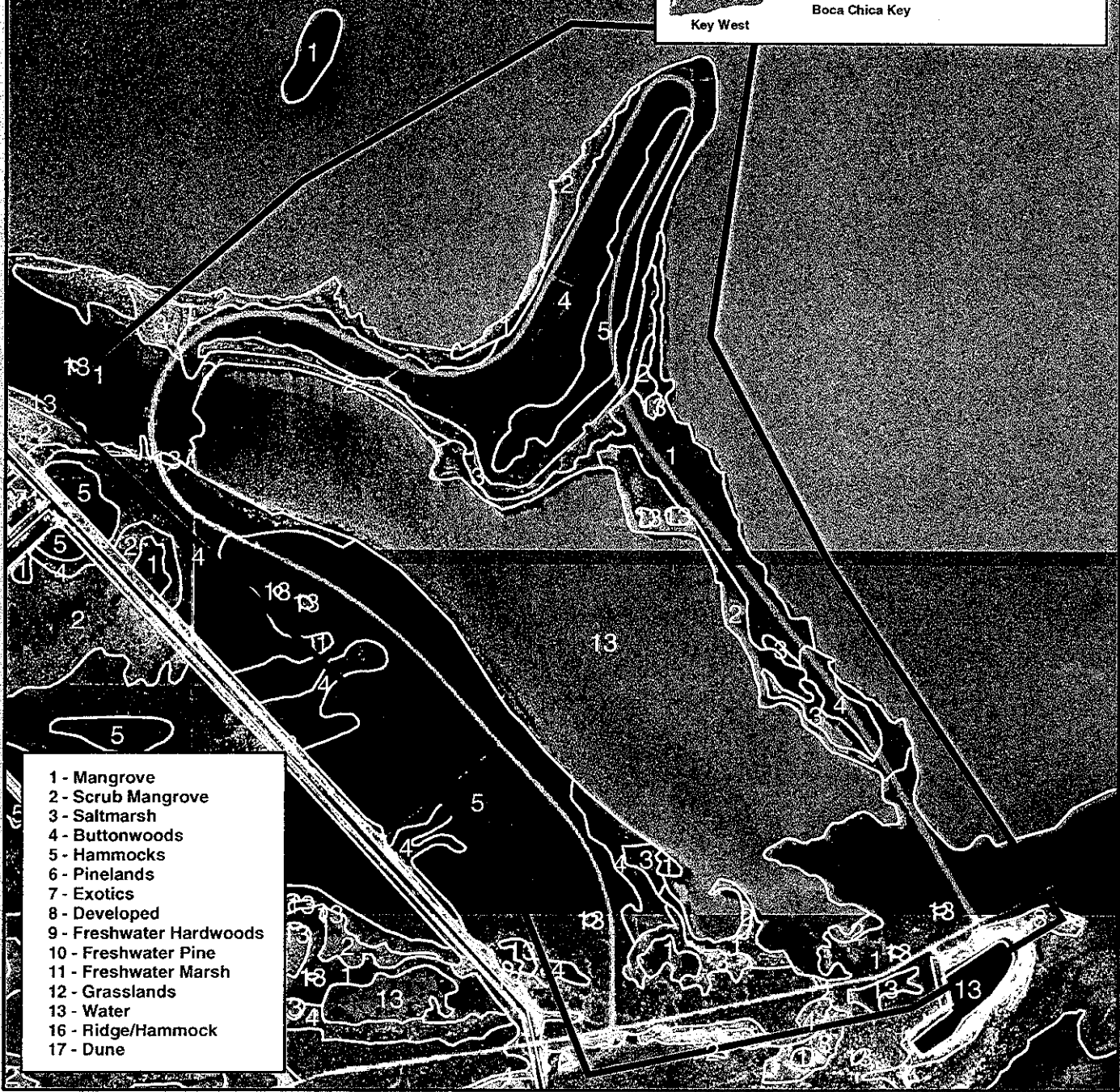
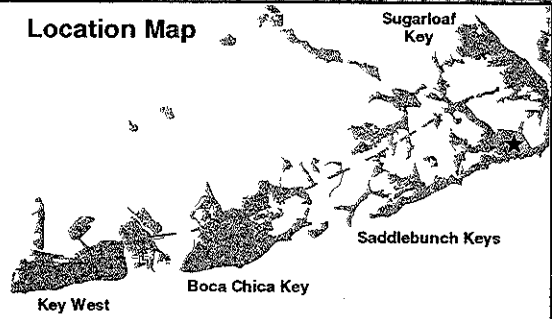
300 150 0 300 Feet

February, 2003



**URS**

# Location Map



- 1 - Mangrove
- 2 - Scrub Mangrove
- 3 - Saltmarsh
- 4 - Buttonwoods
- 5 - Hammocks
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Proposed  
Project Boundary

Habitat Boundary

## Key West International Airport RSA Improvements Sugarloaf Loop Road Removal and Limestone Quarry Restoration

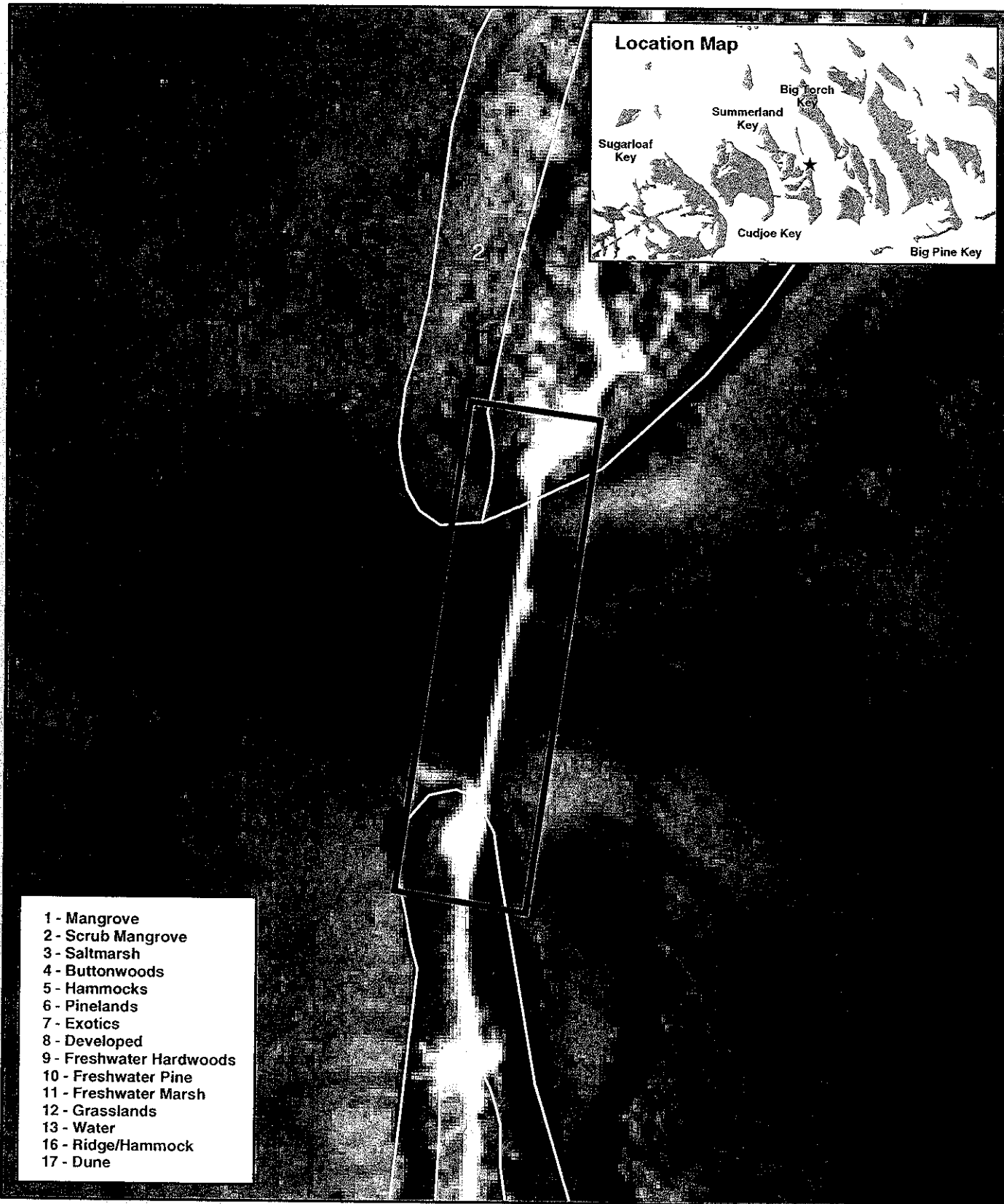
Figure 7 PRELIMINARY



February, 2003



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Proposed  
Project Boundary

Habitat Boundary

# Key West International Airport RSA Improvements

## Summerland Key Bridge Removal

Figure 8 PRELIMINARY



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## **Cudjoe Key**

### **8. Cudjoe Key Limestone Mine Restoration**

Two limestone pits on Cudjoe Key could be restored back to salt marsh/mangrove wetland habitats (see Figure 9). Wetland creation areas would be along the edges of the pits where fill could be removed to create wetland grades. Rock barriers surrounding the pits could be removed to enhance tidal flushing within existing salt/marsh mangrove wetlands.

*Project Benefits:* 8 acres of salt marsh/mangrove wetland restoration.  
10 acres of salt marsh/mangrove wetland enhancement.

*Project Constraints:* The site is under private ownership and will have to be acquired.

### **9. Cudjoe Key Canal Restoration**

A canal on Cudjoe Key that was never opened to the gulf could be filled and grades brought back to salt marsh/mangrove wetland elevations (see Figure 10). Additionally, adjoining fill could be scraped down to create a salt marsh/ mangrove wetland.

*Project Benefits:* 0.67 acre of salt marsh/mangrove wetland restoration.  
0.05 acre of wetland enhancement.

*Project Constraints:* Area is under private ownership and would have to be acquired.

*Cost:* TBD

### **10. Spain Boulevard Culverts and Fill Removal**

Spain Boulevard is a county-maintained road and the main access road for a subdivision located on northern Cudjoe Key (see Figure 11). The road is a fill peninsula that has severed the tidal connection between the mangrove/open water wetlands lying north and south of the road. The mangrove wetland located north of the road shows signs of hyper saline conditions as evidenced by dead and dying mangroves. Culverts could be placed beneath Spain Boulevard to enhance tidal flushing in the impounded mangrove wetland lying north of the road. Additionally, finger fills located along Spain Boulevard could be removed to restore salt marsh wetlands.

*Project Benefits:* 0.38 acre of salt marsh/mangrove wetland restoration.  
23 acres of mangrove wetland enhancement.

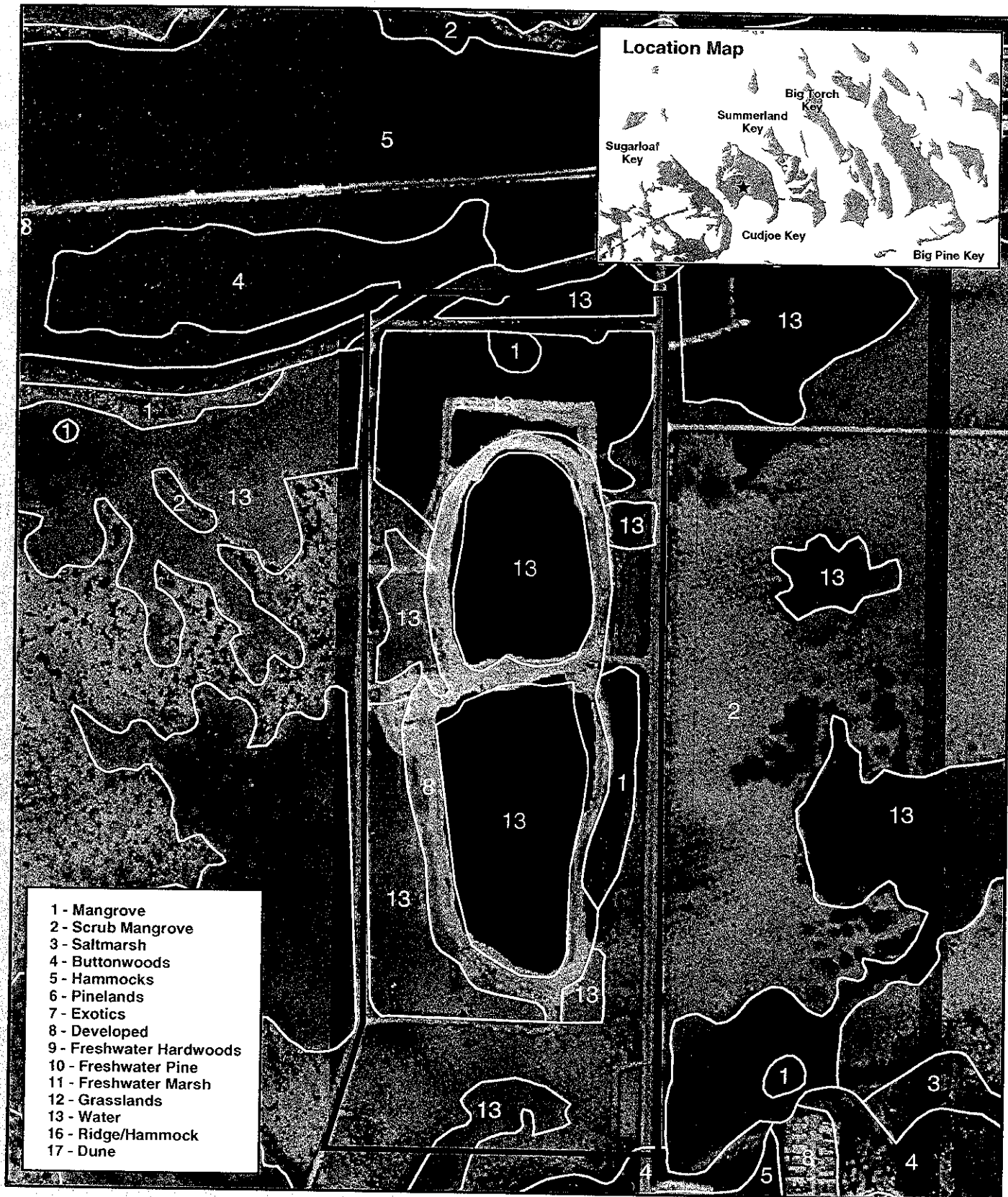
*Project Constraints:* A water utility line may be located underneath the road. Work would be performed within the county road right-of-way.


*Cost:* TBD


### **11. Key Deer Refuge Dredge Hole Restoration**

A dredge hole located on Key Deer Refuge property (see Figure 12) could be restored by placing adjacent spoil material back into the dredge hole to restore mangrove/salt marsh wetland grade. This project was recommended by Key Deer Refuge staff.

*Project Benefits:* 0.79 acre of salt marsh/mangrove wetland restoration and 0.50 acre of salt marsh/mangrove wetland enhancement. Area is under public ownership and would not require acquisition.



 Proposed Project Boundary

 Habitat Boundary

**Key West International Airport  
 RSA Improvements**

**Cudjoe Key Limestone Mine Restoration**

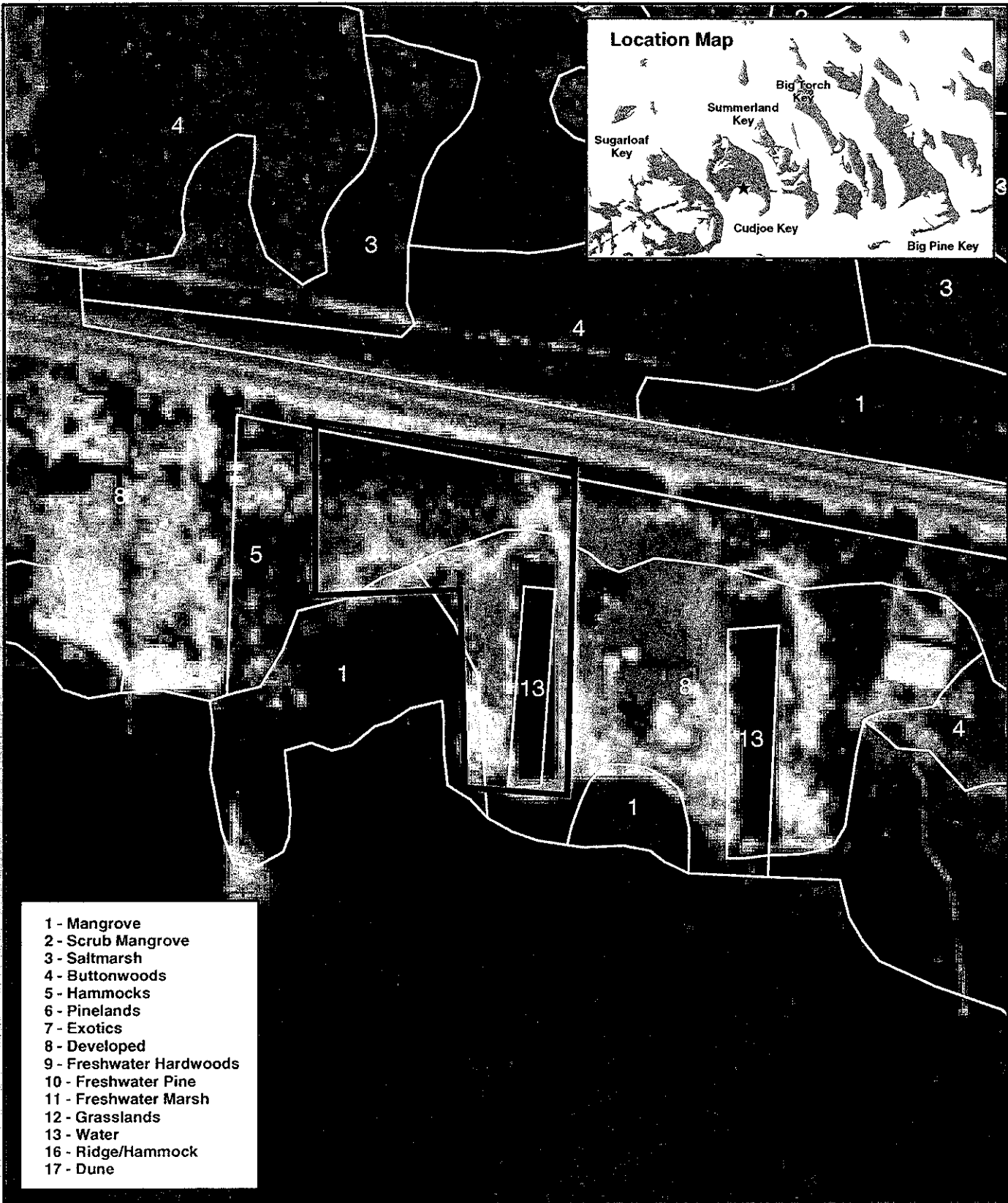
**Figure 9 PRELIMINARY**



300 150 0 300 Feet

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 Proposed Project Boundary  
 Habitat Boundary

## Key West International Airport RSA Improvements

### Cudjoe Key Canal Restoration

Figure 10

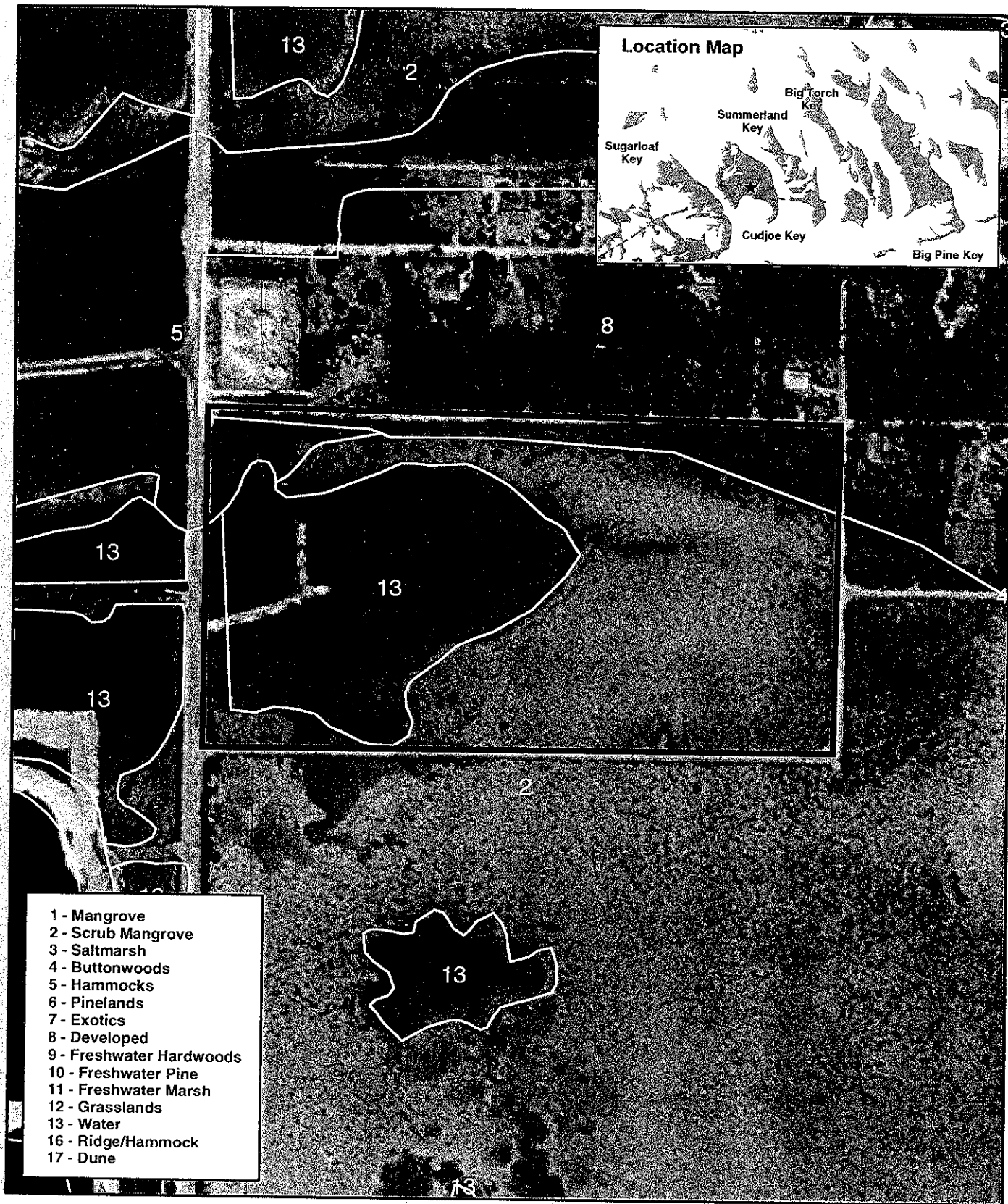
PRELIMINARY



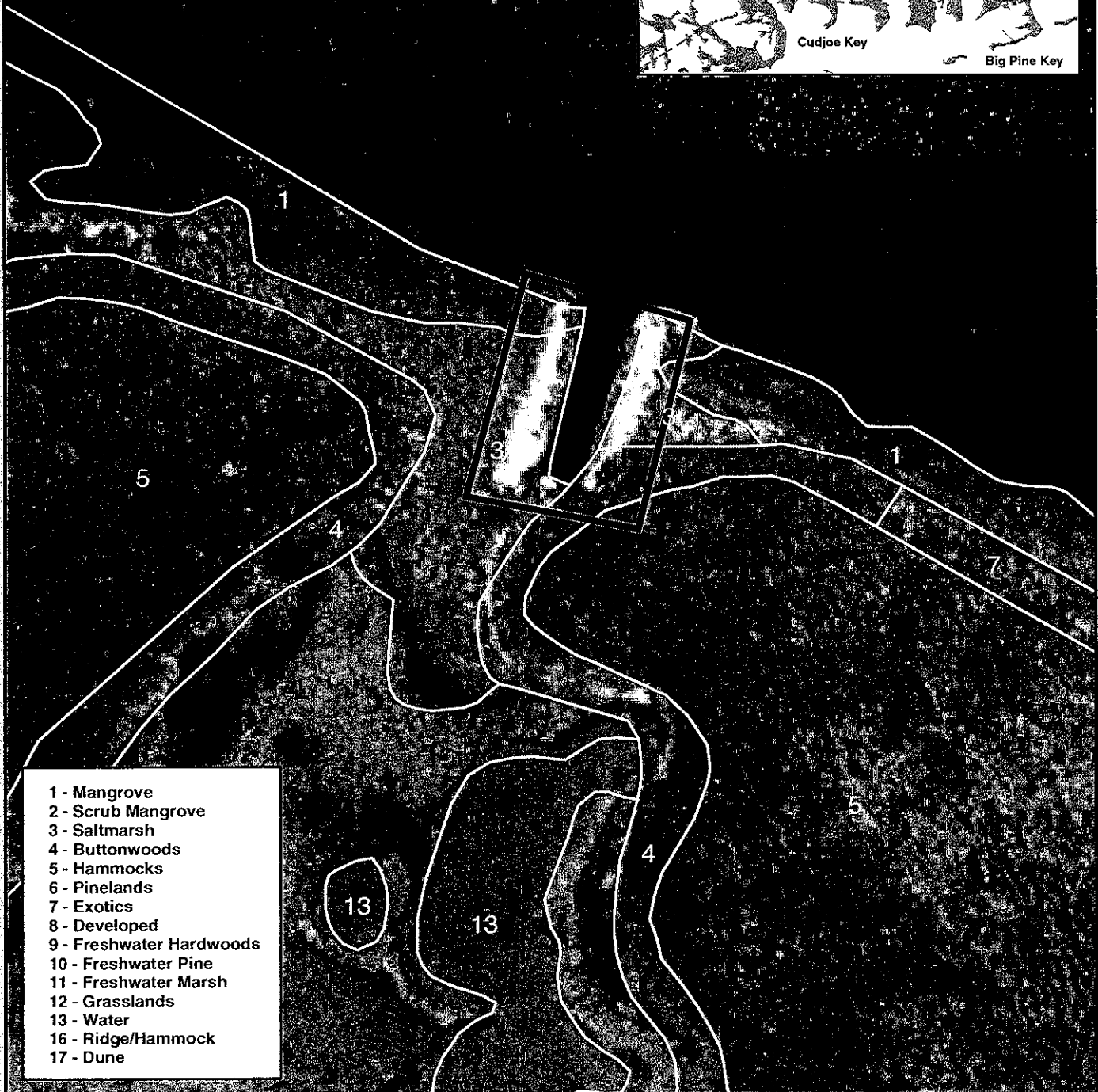
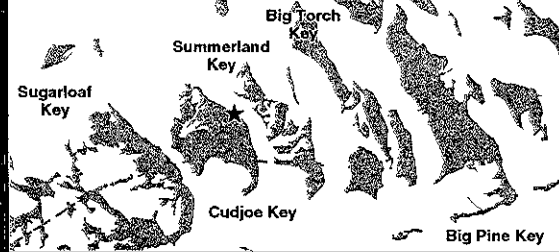
February, 2003



**URS**



# Location Map



- 1 - Mangrove
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Proposed  
Project Boundary

Habitat Boundary

## Key West International Airport RSA Improvements

### Key Deer Refuge Dredge Hole Restoration

Figure 12

PRELIMINARY

150 75 0 150 Feet

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*Project Constraints:* Access to site is over poorly maintained road. Additional materials may be needed to complete the restoration if on-site spoil material is inadequate.

*Cost:* TBD

### **Middle Torch Key**

**12. Finger Fill Removal** – A 450-linear-foot finger fill road located along Dorn road between Middle and Big Torch Keys (See Figure 13) could be removed and the area restored back to salt marsh wetlands. It appears the fill road is located on state owned submerged lands; however, ownership of the road has not been verified.

*Project Benefits:* 0.31 acre of salt marsh restoration.

*Project Constraints:* Acquisition of the road if privately held.

*Cost:* TBD

### **13. Habitat for Humanity Dump Site Restoration**

A dumpsite owned by Habitat for Humanity (see Figure 14) could be restored back to salt marsh/mangrove wetlands. The site was acquired by Habitat for Humanity to construct affordable housing; however, the site may not be appropriate for housing because of its previous use as a dump.

*Project Benefits:* 5.2 acres of salt marsh/mangrove wetland creation and enhancement.

*Project Constraints:* It is unknown what materials have been dumped at this site. Dump clean up prior to wetland creation may preclude consideration of this site.

*Cost:* TBD

### **Big Pine Key**

### **14. Western Big Pine Dredge Hole Restoration**

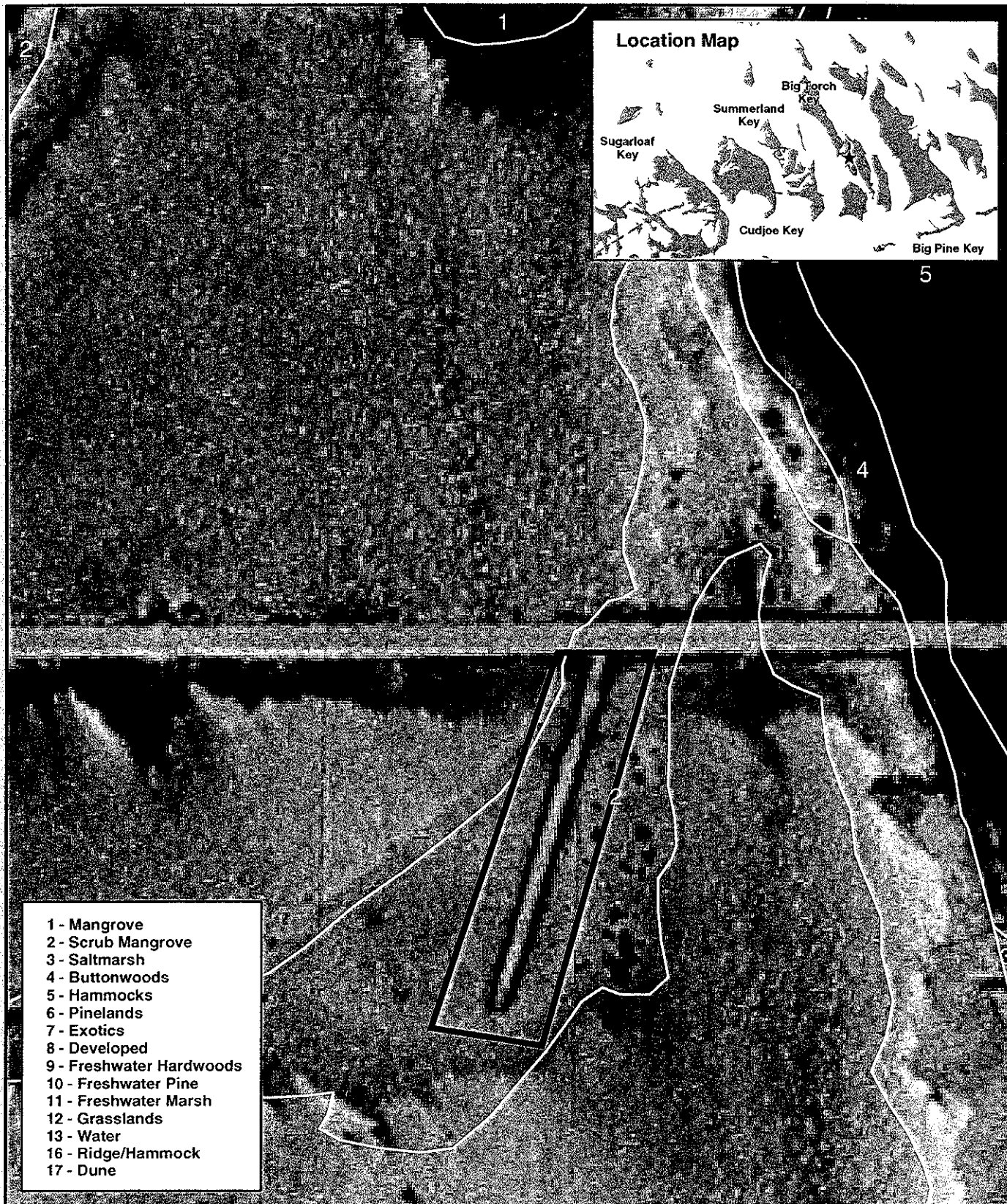
A 0.50-acre dredge hole located on Key Deer Refuge property (see Figure 15) could be restored back to salt marsh/mangrove wetlands. Additionally there is an opportunity to scrape down 2.4 acres of disturbed uplands belonging to the refuge on both sides of U.S. 1 to create mangrove/salt marsh wetlands. The Key Deer Refuge staff recommends this project; however, it is unclear how much upland property would be available for conversion directly adjacent to the dredge hole because the public ownership boundary is unclear.


*Project Benefits:* 2.4 acres of salt marsh/mangrove wetland creation and 0.50 acre of wetland enhancement. Area is under public ownership and would not require acquisition.


*Project Constraints:* This area is used by live-aboard boaters to access Big Pine; however, the refuge wants to discourage this use.

*Cost:* TBD

**15. Key Deer Refuge Borrow Pit Restoration** – A borrow pit located on Key Deer Refuge property could be restored back to salt marsh/mangrove wetlands (see Figure 16). The northern end of the pit would be available to scrape down to create salt marsh/mangrove wetlands. This project was recommended by Key Deer Refuge Staff.



 Proposed Project Boundary

 Habitat Boundary

# Key West International Airport RSA Improvements

Finger Fill Removal

Figure 13

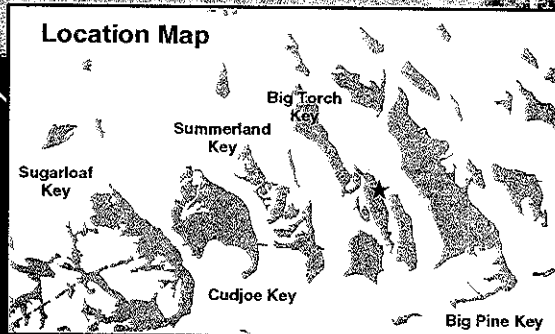
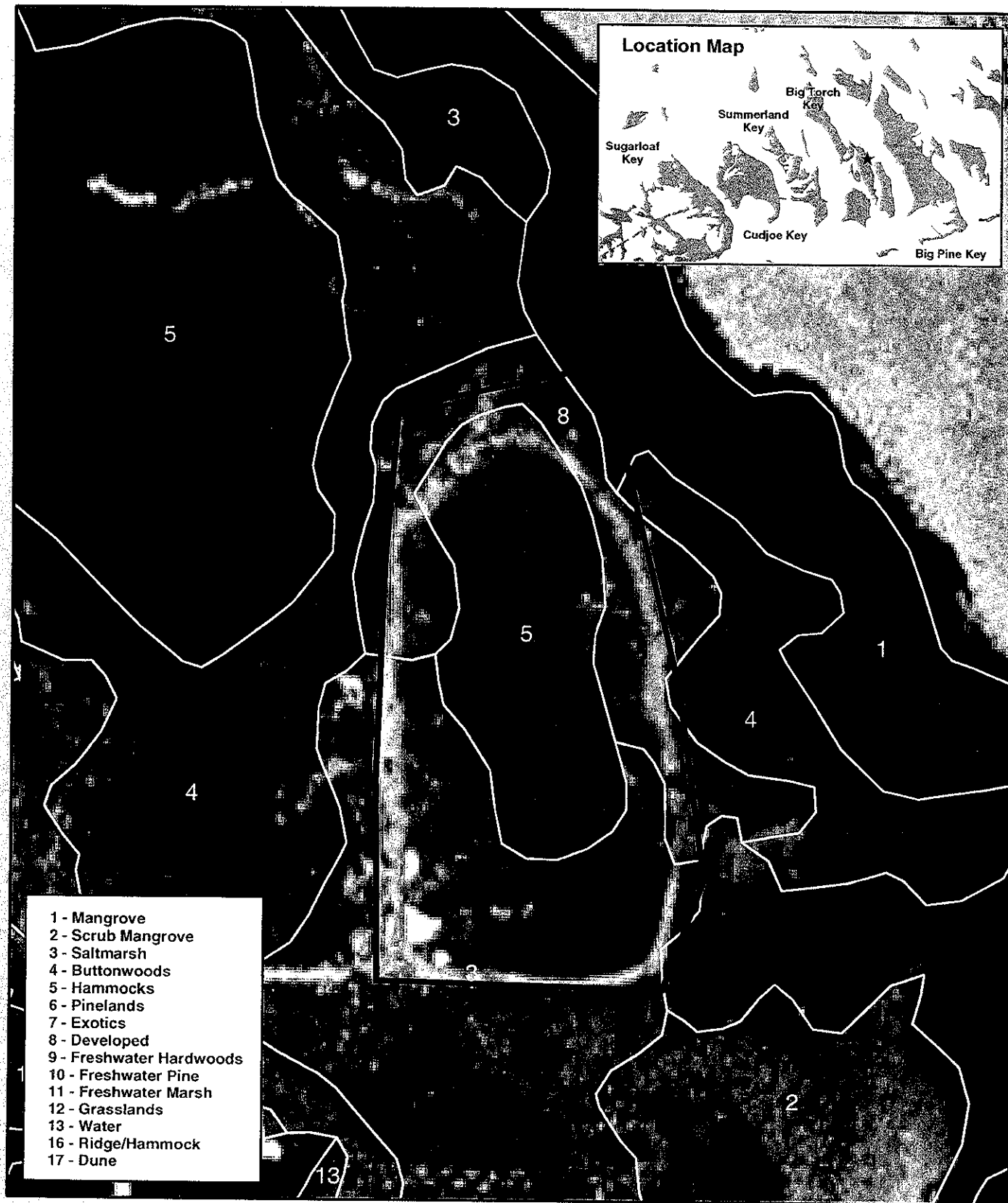
PRELIMINARY

100 50 0 100 Feet

February, 2003



**URS**



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Proposed  
Project Boundary

Habitat Boundary

## Key West International Airport RSA Improvements

Habitat For Humanity Dump Site Restoration

Figure 14

PRELIMINARY

100 50 0 100 Feet



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Proposed  
Project Boundary

Habitat Boundary

# Key West International Airport RSA Improvements

## Western Big Pine Dredge Hole Restoration

Figure 15

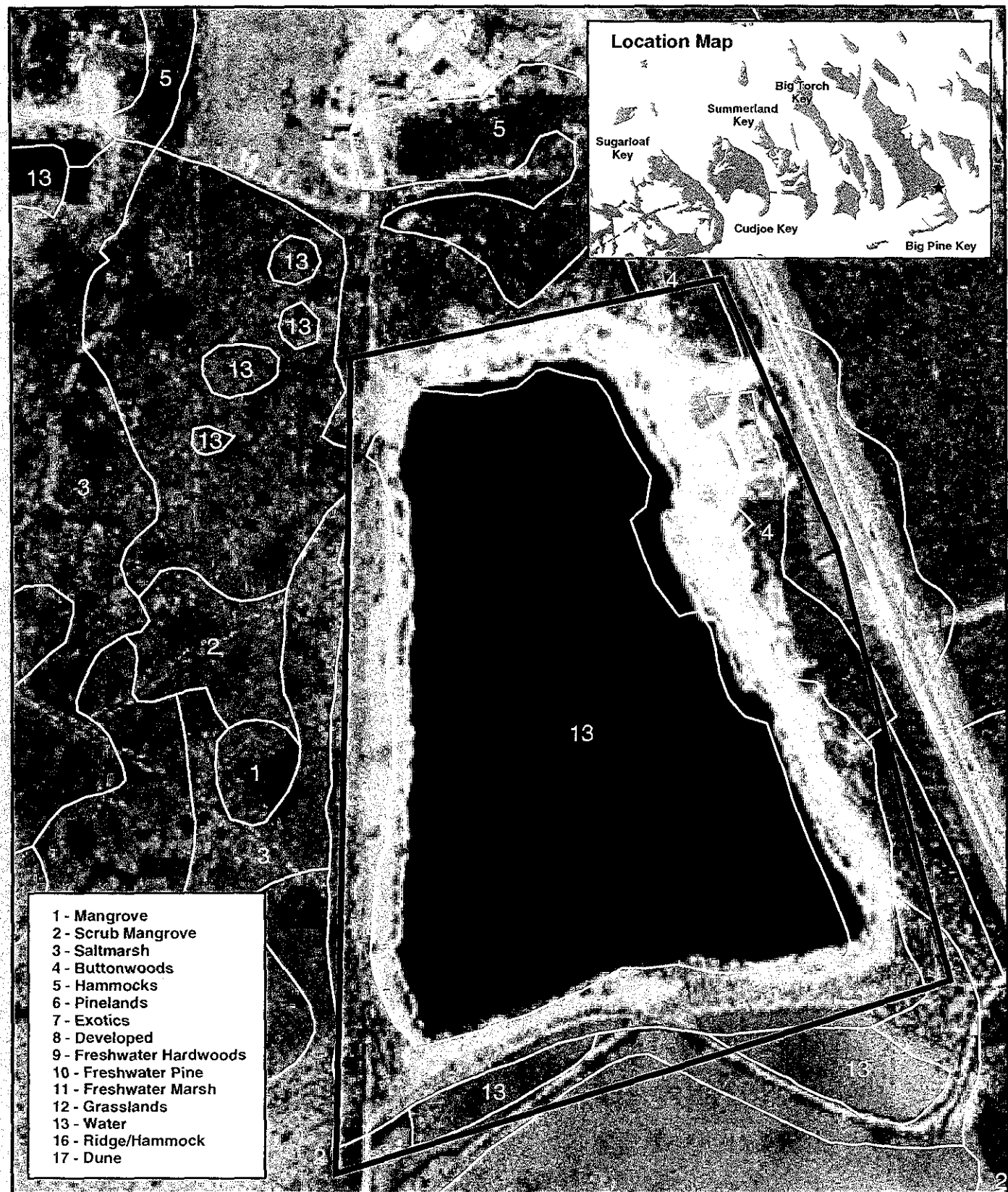
PRELIMINARY

150 75 0 150 Feet

February, 2003



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*Project Benefits:* 3.8 acres salt marsh/mangrove wetland restoration. Area is under public ownership and would not require acquisition.

*Project Constraints:* None.

*Cost:* TBD

### **No Name Key**

#### **16. No Name Key Limestone Pit Restoration**

Portions of an existing limestone mine located on the northwest corner of No Name Key (See Figure 17) could be restored back to salt marsh/mangrove wetlands by scraping down existing pit edges to wetland grade. Additionally, disturbed wetlands adjacent to the mine could be enhanced by increasing tidal flushing and wetland plantings. This property is privately owned and currently for sale.

*Project Benefits:* 4.3 acres of salt marsh/mangrove wetland restoration  
5.3 acres of salt marsh/mangrove wetland enhancement

*Project Constraints:* Area is under private ownership and would require acquisition.

*Cost:* TBD

### **Ohio Key**

**17. Ohio Key Mangrove Restoration** – 4.1 acres of filled mangrove wetlands located on Key Deer Refuge property could be restored to mangrove swamp (see Figure 18). This project was recommended by Key Deer Refuge staff.

*Project Benefits:* 4.1 acres of mangrove swamp restoration. The site is located on public property and would not require acquisition.

*Project Constraints:* None.

*Cost:* TBD

**Total Potential Wetland Creation Available: 103 acres**

**Total Potential Wetland Enhancement Available: 54 acres**

**Total Estimated Creation Needed to Mitigate for RSA Impacts: 52 acres**





Proposed  
Project Boundary

Habitat Boundary

# Key West International Airport RSA Improvements

Ohio Key Mangrove Restoration

Figure 18

PRELIMINARY

150 75 0 150 Feet

February, 2003



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TABLE 1

**WETLAND IMPACTS AND MITIGATION ACREAGES  
KEY WEST INTERNATIONAL AIRPORT  
RSA IMPROVEMENTS**

Wetland Type	FLUCFCS Code	Wetland Quality	Impact Acreage	Proposed Mitigation Ratio*	Mitigation Acreage Required
Mangrove	612	High	8.19	3:1	24.6
Mangrove	612	Medium	3.50	2:1	7.0
Mangrove	612	Low	5.61	1:1	5.6
Salt Pond	540	High	1.70	1.5:1	2.6
Salt Pond	540	Medium	2.20	1:1	2.2
Cap Rock Wetland	731	Low	9.80	1:1	9.8
<b>Totals</b>			<b>31</b>		<b>52</b>

\* Ratios were developed using guidance found in the South Florida Water Management District Basis of Review For Environmental Resource Permits.

**TABLE 2**  
**SUMMARY OF POTENTIAL MITIGATION SITES**  
**KEY WEST INTERNATIONAL AIRPORT**  
**RSA IMPROVEMENTS**

Site Name	Acres of Potential Wetland Creation	Acres of Potential Wetland Enhancement
<b>Key West</b>		
1. Airport Property Restoration	7.0	0
2. City of Key West Property Restoration	11.2	0
<b>Stock Island</b>		
3. Cow Key Road Removal	5.6	0
<b>Boca Chica</b>		
4. North Boca Chica Restoration	40.0	15.0
<b>Sugarloaf Keys</b>		
5. USFWS Key Deer Refuge Road Removal	1.5	0
6. Sugarloaf loop road removal and limestone quarry restoration	7.4	0
<b>Summerland Key</b>		
7. Summerland Key Bridge Removal	.08	.07
<b>Cudjoe Key</b>		
8. Cudjoe Key Limestone Mine Restoration	8.0	10.0
9. Cudjoe Key Canal Restoration	0.7	0.05
10. Spain Boulevard Culverts and Fill Removal	0.4	23.0
11. Deer Refuge Dredge Hole Restoration	0.8	0.5
<b>Middle Torch Key</b>		
12. Finger Fill Removal	0.3	0
13. Habitat for Humanity Dump Site Restoration	5.2	0
<b>Big Pine Key</b>		
14. Western Big Pine Dredge Hole Restoration	2.4	0.5
15. Key Deer Refuge Borrow Pit Restoration	3.8	0
<b>No Name Key</b>		
16. No Name Key Limestone Pit Restoration	4.3	5.3
<b>Ohio Key</b>		
17. Ohio Key Mangrove Restoration	4.1	0
<b>Total Acreage</b>	<b>103</b>	<b>54</b>





## Meeting Documentation

**Project:** Key West International Airport – Runway Safety Area (RSA)  
Feasibility Study

**Meeting Date:** February 20, 2003

**Meeting Location:** South Florida Water Management District (SFWMD)  
West Palm Beach, Florida

**Attendees:** Mr. Ron Peekstok (SFWMD)  
Ms. Anita Bain (SFWMD)  
Ms. Virginia Lane (Federal Aviation Administration / FAA)  
Mr. Peter Green (URS)  
Mr. Ted Murray (URS)  
Mr. George G. Feher (Environmental Consultant)

**By teleconference:** Ms. Jocelyn Karazsia (National Marine Fisheries Service / NMFS)  
Mr. Paul Kruger (Army Corps of Engineers / ACOE)

**Authored By:** Mr. George G. Feher  
Mr. Peter Green  
Mr. Ted Murray

**Subject:** Wetlands Mitigation for the RSA Study

**Distribution:** Project Files  
Attendees

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An updated Study overview had been previously provided by mail to the attendees. This was used as the basis of our discussions. The following is a summary of topics discussed:

### Study Overview and Update

- Mr. Green opened the meeting with a brief overview of the current status of the Study and efforts to find mitigation land for approximately 31 acres of anticipated wetland impacts.
- URS had contacted several governmental agencies during the past two months for mitigation opportunities and the purpose of the meeting is to to present preliminary findings and obtain input as to their suitability for this study.
- FAA stated the previously discussed “wet RSA” – one that could sustain wetland vegetation – is not feasible since it would not meet their engineering safety criteria; therefore, it will no longer be considered.

## Mitigation Requirements and Assumptions

- Mr. Feher discussed how existing habitats on the Airport have been field evaluated and ranked as to High, Medium and Low quality. This was based on professional judgment considering such factors as available perching, roosting and feeding opportunities for birds; faunal trails through the mangroves; evidence of crustaceans and other invertebrates in the substrate; seagrass diversity in the salt ponds, flushing and hyper / hypo-salinity; but, also taking into consideration the recent trimming and alteration to mangroves (FDEP permitted) for the long-term safe operation of the Airport. All of the evaluation assumptions will be presented in the final study document.
- The COE stated it would consider the trimmed and altered mangroves as if they were in their previous untrimmed state; therefore of high quality wetlands.
- Both the NMFS and ACOE indicated a more scientific approach would be required in the permit application; perhaps Wetland Rapid Assessment Procedures (WRAP), or EWRAP. NMFS stated it would send copy of EWRAP to URS.
- All agencies reiterated their previous position that the mangrove and salt pond communities located on the Airport are considered as unique to the region; being the last such habitats of size remaining in the City of Key West. The Applicant will have to demonstrate in the permit application that all efforts have been done to avoid and minimize wetland impacts to the greatest extent practicable prior to the agencies being able to consider a mitigation plan.
- All agencies reiterated their previous position that wetland mitigation is first desirable adjacent to the impact area, preferably on Airport property or contiguous lands; then proceed up-the-keys to a reasonable distance.
- Both SFWMD and the ACOE are also interested in the potential hydrologic impact the RSA may have on the surrounding salt ponds; this will have to be addressed in future studies as the RSA proposal progresses.
- SFWMD stated the mitigation ratios for creation and restoration presented to-date by URS are on the low end of the spectrum; in all likelihood higher ratios will be required during the permitting process. If enhancement will be proposed, ratios would also be in the higher ranges. Also, the application would have to address secondary impacts.
- SFWMD suggested as conceptual mitigation ratios for mangroves: a 3:1 to 5:1 ratio for high quality, a 3:1 ratio for medium quality, and 2:1 for the trimmed (low quality) mangrove wetlands. Usually they do not accept a 1:1 ratio for any of the mangrove communities; only if they are extremely infested with exotic or nuisance species.
- All agencies stressed the need to evaluate cumulative impacts of habitat loss in the area and secondary impacts that could result from the RSA improvements. FAA